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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/773,016

02/05/2004

R. David Anderson

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06/15/2006

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EXAMINER

BANKHEAD, GENE LOUIS

ART UNIT

PAPER NUMBER

3744

DATE MAILED: 06/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/773,016	Applicant(s) ANDERSON, R. DAVID	
	Examiner Gene L. Bankhead	Art Unit 3744	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 February 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☒ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                                               |                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                          | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>02/05/04</u> . | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Specification***

The disclosure is objected to because of the following informalities: Page 19, line 28 "by means of a conduit 66,68 respectively" is believed to be --by means of conduits 66,68 respectively--. Appropriate correction is required.

### ***Drawings***

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "67" has been used to designate both a pump and a conduit in Figure 5. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

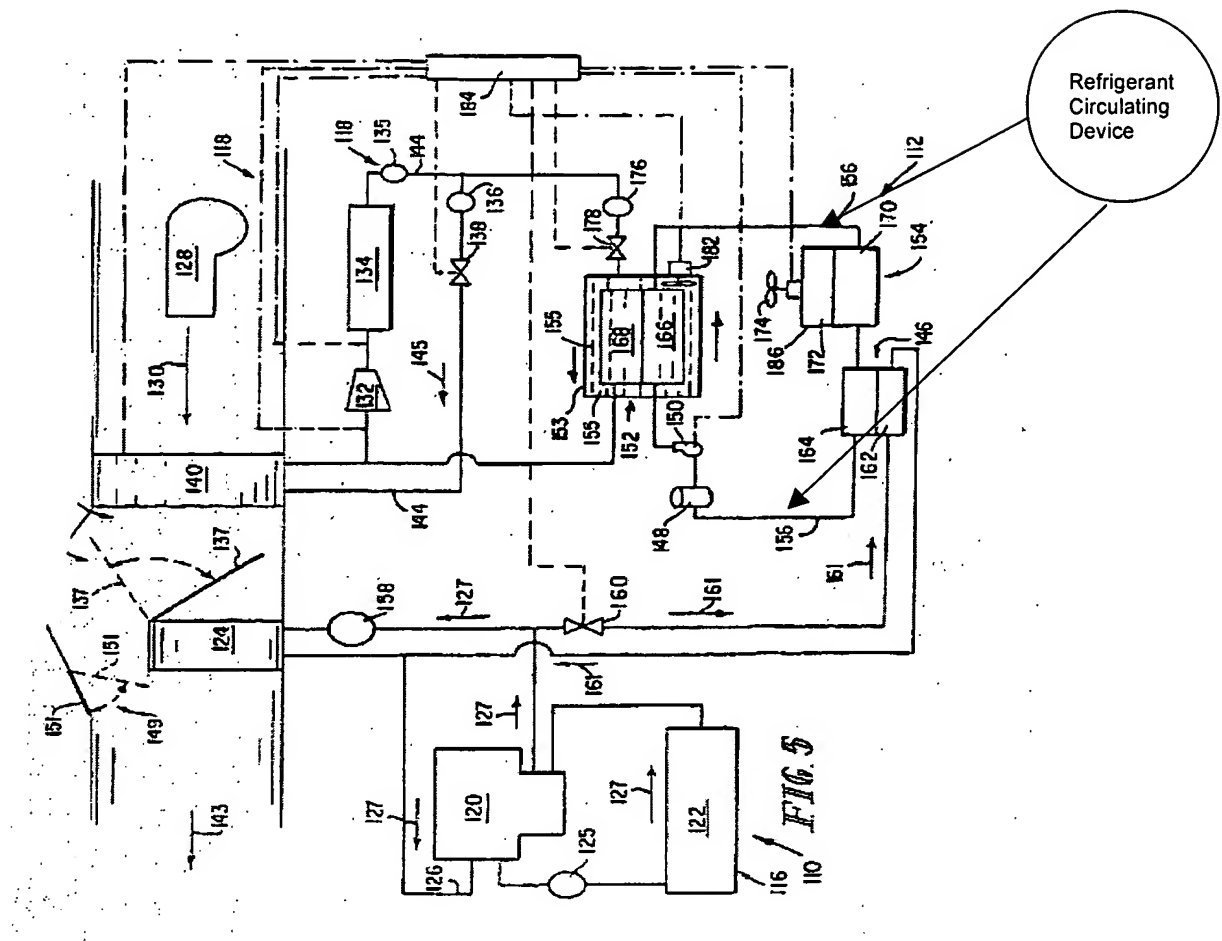
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,2,8-10,15-19, 24 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Longardner (US 5553662). Longardner discloses a thermal energy storage system connected to an air conditioning system. The system comprises a compressor 132 capable of compressing a refrigerant, a condenser 134 connected to the compressor (see Figure 5), an expansion valve 136 and an evaporator unit 140 in heat exchange relationship with an air stream (column 11 lines 10-23). Longardner further discloses a thermal energy storage unit 112 with a tank 152 having a storage medium and an associated heat exchanger 146 between the condenser and evaporator (column 12 lines 29-37). Longardner further teaches a refrigerant circulating device 156, capable of circulating refrigerant through the heat exchanger, between the tank, condenser and evaporator (column 12 lines 29-37, 62-68 and column 13 lines 1-10 and Figure 5). The refrigerant circulating device includes a prime mover 150 and an auxiliary liquid (column 12 lines 40-44 and Figure 5), with the force of the prime mover exerted on the auxiliary liquid being indirectly transferred to the refrigerant (column 12 lines 45-68 and column 13 lines 1-10).



### Figure 5 (Longardner)

Regarding claims 2 and 10, glycol has a higher relative viscosity and lower relative vapor pressure than refrigerants. It is well known in the art Non-Newtonian fluids, such as glycol, have higher relative viscosities and lower relative vapor pressures than Newtonian fluids, such as refrigerant.

Regarding claims 8 and 15, a recitation with respect to the material intended to be used by a claimed apparatus does not impose any structural limitations upon the

claimed apparatus which differentiates it from a prior art apparatus satisfying the structural limitations of the claims, as is the case here.

In regards to claim 9, Longardner teaches all limitations of claim 1. He further discloses a second temporary thermal energy storage tank 154, as recited in claim 9 line 30. Longardner discloses a valve system, 138 and 178, capable of controlling the flow of refrigerant through the system. The valve system is capable of operating to provide the three distinct time periods, as disclosed in claim 9:

Allowing refrigerant to flow from the condenser to the heat exchanger and return to the condenser without using the evaporator (column 15 lines 55-67 and column 16 lines 1-4);

Bypassing the condenser and circulating refrigerant through the thermal storage unit and the evaporator (column 15 lines 55-67 and column 16 lines 1-4):

Utilizing only the temporary refrigerant storage unit with the condenser and evaporator as if the thermal storage unit was absent (column 15 lines 55-67).

The limitations of claims 16-19 and 24-25 have been addressed previously with regards to claims 1-2 and 7-9.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 4, 7, 11, 14, 20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Longardner.

Claim 3 differs from Longardner in calling for the refrigerant Freon. Longardner does not expressly disclose a specific refrigerant. At the time of the invention it would have been obvious to one of ordinary skill in the art to use Freon as it well known in the art that Freon is one of the safest refrigerants available. It is nonflammable, non-corrosive, and non-explosive. It should also be of note a recitation with respect to the material intended to be used by a claimed apparatus does not impose any structural limitations upon the claimed apparatus which differentiates it from a prior art apparatus satisfying the structural limitations of the claims, as is the case here.

Regarding claims 4, 11, 20, and 23 Longardner does not expressly disclose a positive displacement pump as the prime mover. Longardner is silent as to the type of pump used with the thermal storage system. At the time of the invention it would have been obvious to one of ordinary skill in the art to use a positive displacement pump as the prime mover, as it is well known that rotary pumps put out a constant volume of liquid regardless of the pressure (US 5771693, column 20 lines 64-68 and column 21 lines 1-12). This is important in order to maintain a constant flow rate despite the fluctuation of pressures that occur during the operation of air conditioners.

Claims 5, 6, 12, 13, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Longardner in view of Clark Jr. (US 4617801).

Regarding claims 5, 12, and 21. Claim 5 differs from Longardner in calling for a prime mover mechanically coupled with fluid cylinders to circulate the refrigerant. Longardner teaches a prime mover 150 mechanically coupled to an engine 120 (column 10 lines 42-56 and column 12 lines 29-68 and column 13 lines 1-10). Longardner teaches most limitations of claim 5, however does not disclose a pair of fluid cylinders communicating with a prime mover. Clark Jr. discloses a thermally powered engine 10 with two fluid cylinders 22, and 24. Longardner teaches a thermal storage system 112, connected to an air conditioning system, coupled to an engine 120 via an engine coolant loop system 116 (column 10 lines 42-56 and column 12 lines 29-68 and column 13 lines 1-10). Modifying the engine of Longardner with the engine of Clark Jr. enables the prime mover 150 of Longardner to be coupled with the pistons 50 and 56 of cylinders 22 and 24 of the Clark Jr. engine during the pump's 150 operation (column 10 lines 42-56 and column 12 lines 29-68 and column 13 lines 1-10). At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the engine of Longardner with Clark Jr. because coupling piston's with the prime mover greatly increases the amount of work done on the refrigerant being circulated. Simple fluid mechanics teaches the amount of work done on the refrigerant due to the prime mover acting alone is far less than the amount of work done on the refrigerant when the prime mover is coupled with a hydraulic cylinder with fluid. Clark Jr. does not specify oil as the fluid used in the cylinders. It would have been obvious to one of ordinary skill in the art to use oil, as it well known in the art that oil is incompressible and thus increases the efficiency of the hydraulic cylinder.



Regarding claims 6,13 and 22 Clark Jr. further teaches flexible bladders 68 and 70 located within each of the fluid cylinders, see Figure 6.

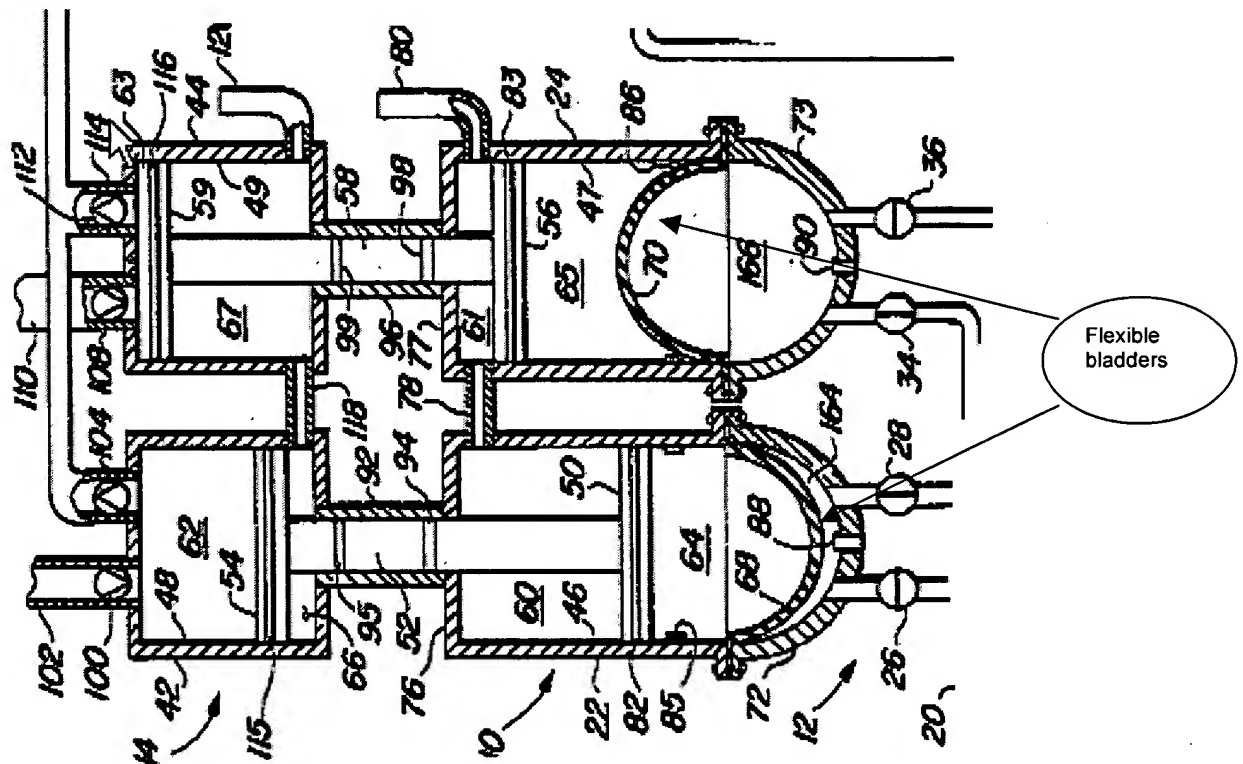


Figure 6 (Clark Jr.)

Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Longardner in view of Papst. Claims 7 and 14 differ from Longardner in calling for a prime mover that is powered by a direct current motor and battery. Longardner teaches a pump powered by an electro-mechanical control device.

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DC motor 9 and battery 2 (column 2 lines 29-37). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the engine of Longardner with Papst as it well known in the art electric motors have a greater efficiency, between 60-90 percent, than conventional fuel vehicle engines and provide excellent speed control for starting and stopping, due to the excellent ability of DC motors to control torque.


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gene L. Bankhead whose telephone number is (571)-272-8963. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571)-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
CHERYL TYLER  
SUPERVISORY PATENT EXAMINER

GB  
Examiner  
Art Unit 3744